

AZTEKAS: a hydrodynamic GPL code

Version1.0

Generated by Doxygen 1.8.16

1 AZTEKAS: a hydrodynamic GPL code	1
2 File Index	3
2.1 File List	3
3 File Documentation	5
3.1 alloc.c File Reference	5
3.1.1 *	5
3.1.2 Detailed Description	5
3.2 array.c File Reference	6
3.2.1 *	6
3.2.2 Detailed Description	6
3.3 auxfunc.c File Reference	6
3.3.1 *	6
3.3.2 Detailed Description	7
3.4 bound_cond.c File Reference	7
3.4.1 *	7
3.4.2 Detailed Description	7
3.5 flux.c File Reference	7
3.5.1 *	7
3.5.2 Detailed Description	8
3.6 input.c File Reference	8
3.6.1 *	8
3.6.2 *	8
3.6.3 Detailed Description	8
3.7 integration.c File Reference	8
3.7.1 *	8
3.7.2 Detailed Description	9
3.8 main.c File Reference	9
3.8.1 *	9
3.8.2 Detailed Description	9
3.9 timestep.c File Reference	9
3.9.1 *	9
3.9.2 *	10
3.9.3 Detailed Description	10
Index	11

Chapter 1

AZTEKAS: a hydrodynamic GPL code

This program is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation, either version 3 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program. If not, see [http↵://www.gnu.org/licenses/](http://www.gnu.org/licenses/).

Chapter 2

File Index

2.1 File List

Here is a list of all documented files with brief descriptions:

alloc.c	Essential allocation functions for <i>aztekas</i>	5
array.c	Functions to simplify the index vector access	6
auxfunc.c	Helpful functions for <i>aztekas</i>	6
bound_cond.c	Standard boundary conditions	7
flux.c	Numerical flux computing and implementation	7
input.c	Important input parameters for <i>aztekas</i>	8
integration.c	Main function for the time integration in the conservative variables Q	8
main.c	Main file of <i>aztekas</i>	9
timestep.c	Time-step calculation	9

Chapter 3

File Documentation

3.1 alloc.c File Reference

Essential allocation functions for *aztekas*.

```
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>
#include "main.h"
#include "param.h"
```

3.1.1 *

Functions

- void **allocateArray** ()
- void **new_SIZE** ()

3.1.2 Detailed Description

Essential allocation functions for *aztekas*.

Author

Alejandro Aguayo-Ortiz

3.2 array.c File Reference

Functions to simplify the index vector access.

```
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>
#include "main.h"
#include "param.h"
```

3.2.1 *

Functions

- int **c1** (int n, int i)
- int **c2** (int n, int i, int j)
- int **c3** (int n, int i, int j, int k)

3.2.2 Detailed Description

Functions to simplify the index vector access.

Author

Alejandro Aguayo-Ortiz

In this file we include three functions for passing the standard C notation for a vector:

```
U[i*N_j*N_k + j*N_k + k]
```

to a much simpler notation

```
U[(i,j,k)]
```

3.3 auxfunc.c File Reference

Helpful functions for *aztekas*.

```
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>
#include "main.h"
#include "param.h"
```

3.3.1 *

Functions

- int **MxV** (double *M, double *V, double *L)
- void **roundgen** (double *num)

3.3.2 Detailed Description

Helpful functions for *aztekas*.

Author

Alejandro Aguayo-Ortiz

3.4 bound_cond.c File Reference

Standard boundary conditions.

```
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>
#include "main.h"
#include "param.h"
```

3.4.1 *

Functions

- void **OUTFLOW** (double *B)
- void **REFLECTIVE** (double *B)
- void **PERIODIC** (double *B)

3.4.2 Detailed Description

Standard boundary conditions.

Author

Alejandro Aguayo-Ortiz

3.5 flux.c File Reference

Numerical flux computing and implementation.

```
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>
#include "param.h"
#include "main.h"
```

3.5.1 *

Functions

- int **FLUX1D** (vec_ *v, lim_ *l, int *l)
- int **FLUX2D** (vec_ *v, lim_ *l, int *l)
- int **FLUX3D** (vec_ *v, lim_ *l, int *l)
- int **HLL** (double *F, flx_ *f, int x)
- int **HLLC** (double *F, flx_ *f, int x)

3.5.2 Detailed Description

Numerical flux computing and implementation.

Author

Alejandro Aguayo-Ortiz

3.6 input.c File Reference

Important input parameters for *aztekas*.

```
#include <stdio.h>
#include <omp.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>
#include "main.h"
```

3.6.1 *

Functions

- int **read_parameters_file** (char const *paramfile_name)

3.6.2 *

Variables

- FILE * **paramfile**

3.6.3 Detailed Description

Important input parameters for *aztekas*.

Author

Emilio Tejeda

3.7 integration.c File Reference

Main function for the time integration in the conservative variables **Q**.

```
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>
#include "main.h"
#include "vector.h"
```

3.7.1 *

Functions

- int **INTEGRATION** ()

3.7.2 Detailed Description

Main function for the time integration in the conservative variables Q .

Author

Alejandro Aguayo-Ortiz

3.8 main.c File Reference

Main file of aztekas.

```
#include <stdio.h>
#include <omp.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>
#include "main.h"
#include "param.h"
```

3.8.1 *

Functions

- int **main** (int argc, char *argv[])

3.8.2 Detailed Description

Main file of aztekas.

Author

Alejandro Aguayo-Ortiz.

3.9 timestep.c File Reference

Time-step calculation.

```
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#include <string.h>
#include "../Headers/main.h"
```

3.9.1 *

Macros

- #define **min**(a, b) (((a)<(b))?(a):(b))
- #define **max**(a, b) (((a)>(b))?(a):(b))

3.9.2 *

Functions

- double **TIMESTEP** ()

3.9.3 Detailed Description

Time-step calculation.

Author

Alejandro Aguayo-Ortiz

Index

alloc.c, [5](#)
array.c, [6](#)
auxfunc.c, [6](#)

bound_cond.c, [7](#)

flux.c, [7](#)

input.c, [8](#)
integration.c, [8](#)

main.c, [9](#)

timestep.c, [9](#)